AMAZONIANA | III | II | 224 – 230 | Kiel, Aug. 72

A new species of Monocondylaeinae from the Amazon basin, and some considerations on this subfamily in the hydrographic systems of South America

by Argentino A. Bonetto *)

As is well known Nayades of the subfamily Monocondylaeinae constitute a very characteristic group and are easily set apart from the rest of the neotropical Mutelacea, on the basis of the presence of articular elements in the hinge. These usually consist of one or more rounded-projections or toothed bosses, and provide a reliable and precise diagnostic feature in all well developed specimens.

In this whole group, as we pointed out in 1966, two tribes can be distinguished : Monocondylaeini and Fossulini, based on the nature of the articulating apparatus of the shells. Generally the articulating teeth of the Monocondylaeini are well developed and of the rounded-projection type, and the whole apparatus — including the articulating cavities — is covered by the nacreous layer. In the Fossulini, the teeth are less well developed and the articular area is defined by depressions and projections incesed on the line of the hinge, and it is possible to distinguish over all the articular surface a thick prismatic layer, i.e. it is not covered, as in the previous group, by the nacreous layer.

So far as the position of the Monocondylaeinae within the subfamily Mutelacea is concerned, it must be pointed out that it is isolated, and it is difficult to establish its relationship to the other subfamilies.

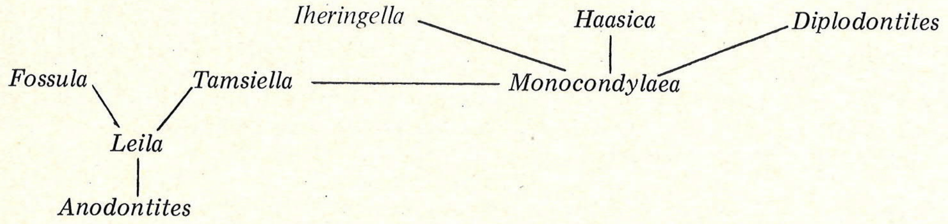
ORTMANN considered it to be the most primitive of the South American Mutelacea because of the articular apparatus, but this supposition is based exclusively on the presumed relationship between the two big groups of South American Nayades that ORTMANN united in a single taxon (family Mutelidae). According to him the most modern forms are those with an edentate hinge (Mutelinae), which were derived from forms with a hinge provided with well developed teeth (Hyriinae). However, as it was established by PARODIZ and BONETTO (1963), there is no close relationship between these groups, that is to say between the Hyriidae (= Hyriinae of ORTMANN) which have a heterodont hinge, and the Mycetopidae (=Mutelinae of ORTMANN) which have an edentate hinge, or a hinge with feebly developed teeth as in the Monocondylaeinae. The family Mycetopidae, to which the Monocondylaeinae belong, shows clear and indubitable relationships with the family Mutelidae of Africa. These together form the superfamily Mutelacea, while the rest of the Nayades of the world are united in the superfamily Unionacea.

It seems reasonable to suppose that these Nayades represent a group of recent differentiation, derived from those with the basic edentate hinge which is characteristic of the remaining Mutelacea, and they could represent the perfecting of the system to be seen in an incipient form in the genus *Leila* GRAY.

The finding of a new species of the genus *Tamsiella* HAAS in the Juruá River, an affluent of the Solimões River in the state of Acre, Brazil, that will be described under the name of *Tamsiella amazonica* nov. sp., provided the opportunity to study in detail the articular apparatus, and certain other characteristics of the genus. As an outcome of these investigations we introduce some changes to the scheme proposed in 1966. In fact, the articular apparatus of the genus as revealed by *T. amazonica* — *T. tamsiana* DUNKER we know only through the literature — reveals deep differences from that which is characteristic of the tribe Monocondylaeini, being very near to that characterizing the Fossulini.

In our example of *T. amazonica* a substantial reduction of the teeth and a considerable modification of the articular area, coincides on the whole with HAAS ' description. Likewise, it is easy to see that the nacreous layer covers only the inner face of the teeth as a result of modifications of the hinge line. The rest of the teeth and the articular cavities, reveals a thick prismatic layer.

Because of this we consider that the genus *Tamsiella* HAAS must not be included in the tribe Monocondylaeini but in the Fossulini, because although there are some differences in the form and sculpture of the teeth and cavities they are of the same general form. In *Fossula* the tooth is more or less quadrangular and projects little, while in *Tamsiella* it tends to be triangular and projects more conspicuously. Furthermore although these characters are of less importance, we point out that *T. amazonica* tends to be bilaterally flattened and that the folds of the periostracum are extremely reduced. Some radial lines are present corresponding to the microscopic sculpture (the "puckered radiating impressed lines" of MARSHALL). There is no posterior ridge, the posterior slope is smooth, and there are no coloured lines. These details not only support the phyletic separation proposed by HAAS , but also lead to place *Tamsiella* in an intermediate position between the typical Monocondylaeini and the genus *Fossula*. The suggested relationships can be indicated as follows :



Tamsiella amazonica nov. sp.

Diagnosis : Shell of moderate thickness. Outline suboval to subtrapezoidal with the anterior margin somewhat acutely and the posterior margin blunty rounded. Dorsal and ventral margins curved in a more or less regular manner, the dorsal merging with the posterior margin by an obtuse angle. The valves are flattened laterally, and have a smooth surface without posterior corrugations. There is a slight antero-ventral gap. Periostracum thin, lightly „clothlike" in the terminology of MARSHALL, without gloss, and showing in isolated areas some „puckered radiating impressed lines" similar to, though less well defined than those of the genus *Anodontites*. The colour of the periostracum is yellowish ochre. The nacreous layer of the inner surface is bluish white in colour and moderately iridescent.

Prismatic area of considerable width and best developed towards the middle of the ventral edge, though this varies a little in the different paratypes. Ligamental scar triangular as is typical of the Mutelacea. Anterior muscle scar moderately impressed, posterior scar lightly impressed. Two or three little rounded impressions can be seen corresponding to the retractors, arranged in a series towards the umbone cavity.

---

*) Fellow of the Scientific Research Career of the National Council of Scientific and Technical Research (República Argentina).

The articular apparatus is constituted by feebly developed but deep and triangular cavities. In the right valve there is a small and sharp tooth – almost a spine –, adjacent to an elongate, somewhat triangular notch orientated in an almost horizontal position in front of and below the apical extremity of the umbone. This notch, widening posteriorly, is contiguous with a little elevation of the hinge line that perhaps represents a rudimentary second tooth.

In the left valve the articulating elements consist anteriorly of a slightly modified area of the hinge line that does not constitute a real tooth followed by the articulating notch which lies somewhat obliquely and extends forward almost to the anterior extremity of the umbone. Behind the notch is a slightly higher and blunter articular tooth than that of the opposite valve.

The outer surface of the valves is smooth, without a posterior ridge. There are no coloured lines in this position such as are usual in this subfamily. Soft parts unknown, shells only being available.

Remarks : The form of the valves varies a little in different paratypes, being sometimes more ellipsoidal or rhomboidal than that of the holotype, but always being higher and more rounded than that of *Tamsiella tamsiana*. The development of the articulating apparatus is also somewhat variable but corresponds in general with the description of the holotype. It is remarkable that in specimens less than 3 cm in length the differentiation of the articular apparatus is scarcely to be distinguished, whereas in typical *Monocondylaea* the tooth is distinct even in such small individuals. There are also variations of less interest in the colour of the valves and in the ridges and sculpture of the periostracum.

Whereas in the Mutelacea as a whole there are usually no impressions of retractor muscles, three such are usually present in *Tamsiella amazonica*. Although these differ somewhat in number and disposition in the different paratypes they are present in all examples.

Locality : All the material is from the Juruá River, an affluent of the Solimões River in the state of Acre, between Villa Taumaturgo and Fóz do Bréu, that is to say in the neighbourhood of the border with Perú and Bolivia. These were collected by PRICE in 1956, and given to us for study by the authorities of the Goeldi Museum of Belém, Pará, Brazil, to whom we give thanks and where the holotype is being deposited.

Dimension of some specimens :

		Length	Height	%Length	Diameter	%Length
Holotype	1	10,81	7,82	72,34	3,94	36,44
Paratype	1	7,53	5,34	70,91	2,61	34,66
Paratype	2	7,12	4,96	69,66	2,61	36,65
Paratype	3	6,65	4,73	71,12	2,52	37,89
Paratype	4	4,93	3,72	75,45	1,84	37,32
Paratype	5	4,05	2,94	72,59	1,53	37,77
Paratype	6	2,97	2,12	71,38	1,03	34,68

Some considerations on the geographical distribution of Nayades of the subfamily Monocondylaeinae.

Except for *Monocondylaea*, most genera of subfamily have a limited number of species, most being monotypic. Many appear to have very local or restricted areas of distribution. The genus *Monocondylaea* has a considerable number of species which are distributed throughout the principal river systems of South America. *Iheringella* and *Haasica* (which should probably be united in a single genus) occur in the Upper Paraguay River and extend towards the head waters of the Amazon River in Bolivia, a region which has transitory contacts with the Upper Paraguay River.

Diplodontites of which only two species are known, occurs in the basin of the Orinoco River and the head waters of the Amazon and Magdalena Rivers. The genus *Fossula* occurs in most of the la Plata basin (Paraguay, Upper Paraná and Uruguay Rivers) being remarkable in that its occurrence is limited to stretches of fast flowing water with a hard or rocky bottom, and it disappears in the lower and middleportions of these rivers. It is found also in the São Francisco and Paraguassú Rivers in the state of Bahía, from where a new species was recently described. It is an interesting fact that to date *Fossula* has not been found in the Amazon River.*)

The genus *Tamsiella* was hitherto known only from the Chirgua River, near Puerto Cabello, which is a head water of the Orinoco River. The new species comes from the Juruá River, in Taumaturgo, i.e. in the neighbourhood of the border with Perú, thereby considerably extending the distribution of genus. This also tends to confirm the suggestion that the apparently limited known distribution of many genera is a result of their tendency to establish themselves in localized areas, such as the upper reaches of different rivers.

---

*) PILSBRY and OLSSON described in 1944 a new species of *Fossula*, in the Guarico River, at Barbacoas' state of Guarico, Venezuela. The photograph of the type is not clear, especially on the articular apparatus, and the description is very poor, being possible it will be another species of the genus *Tamsiella* HAAS.

Summary

In this work *Tamsiella amazonica* nov. sp. a new species of Nayades of the genus *Tamsiella* HAAS, belonging to the Juruá River, an affluent of the Solimões River, between Taumaturgo and Fóz do Bréu, Brazil, is described.

At the same time an analysis and new regrouping of the existing genera of Monocondylaeinae, is made, giving some considerations about the geographical distribution of its genera in South American waters and its probable phyletic relationship.

Resumo

Nêste trabalho descreve-se *Tamsiella amazonica* nov. sp., uma espécie nova de Nayades do gênero *Tamsiella* HAAS, proveniente do Rio Juruá, afluente do Rio Solimões, entre Taumaturgo e Fóz do Bréu, Brasil.

No mesmo tempo executam-se uma análise e um novo reagrupamento dos gêneros existentes de Monocondylaeinae, apresentando-se considerações sôbre a distribuição geográfica dos gêneros daquela família em águas sulamericanas e sôbre as suas relações filéticas prováveis.

Bibliography

ADAMS , H., 1870 : List of additional species of land and fresh-water shells collected by Mr. E. BARTLETT in eastern Perú. — Proc. zool. Soc. London, 1870 : 374—376.

BAKER , H.B., 1930 : The mollusca collected by the University of Michigan-Williamson expedition in Venezuela. VI. — Occ. Pap. Mus. Zool. Univ. Michigan. 210 : 1—95.

BONETTO , A.A., 1963 : Contribución al conocimiento de *Leila blainvilleana* (LEA). — Physis, 24 (67) : 11—16.

—,1966 : Espécies de la subfamilia Monocondylaeinae en las águas del sistema del Río de la Plata. — Arch. Moll. 95 (1/2) : 3—14.

BONETTO , A.A. & EZCURRA , I.D., 1963 : Notas Malacológicas, I. — Physis, 24 : 17—21.

DUNKER , W., 1858 : Einige neue Species der Naiaden. — Mal. Blätt. 5 : 225—229.

HAAS , F., 1930—1931 : Versuch einer kritischen Sichtung der südamerikanischen Najaden. — Senckenbergiana, 12 (4/5) : 175—195 (1930); 13 (1) : 30—52 (1931); 13 (2) : 87—110 (1931).

—, 1969 : Superfamilia Unionacea. — Das Tierreich, 88 : 1—663.

IHERING , H. von, 1893 : Najaden von São Paulo und die geographische Verbreitung der Süßwasser-Faunen von Südamerika. — Arch. Naturg., 1893 (1) : 45—140.

—, 1910 : Über brasilianische Najaden. — Abh. senckenb. naturf. Ges., 32 : 111—140.

—, 1915 : Molluscos, in Annexo N°5, Commissão de Linhas Telegráphicas Estratégicas de Matto-Grosso ao Amazonas : 1—14. Rio de Janeiro.

LEA , I., 1834—1874 : Observations on the genus *Unio*. — Philadelphia.

MARSHALL , W.B., 1922 : New pearly fresh water mussels from South America. — Proc. U.S. Nat. Mus., 61 : 1—9.

—, 1925 : Microscopic sculpture of pearly fresh water mussels shell. — Proc. U.S. Nat. Mus., 67 : 1—14.

OLAZARRI , J., 1964 : Primer hallazgo de *Fossula* en la cuenca del Río Uruguay. — Com. Soc. Malac. Uruguay, 1 (6) : 150—155.

OLSSON , A.A. & WURTZ , C.B., 1951 : New Colombian Naiades, with observations on other species. — Notulae Naturae, 239 : 1—9.

ORBIGNY , A.D., 1835 : Synopsis terrestrium et fluviatilium molluscorum in suo per Americam Meriodionalem itinere. — Mag. Zool., (V) Nr. 61 : 44 pp.

—, 1835—1843 : Voyage dans l'Amérique Méridionale. V, 3 Mollusques : 1—758.

ORTMANN , A.E., 1921 : South American Naiades, a contribution to the knowledge of the freshwater mussels of South America. — Mem. Carnegie Mus., 8 : 451—670. Pittsburgh.

PILSBRY , H.A., 1893 : Notes on the genera of Unionidae and Mutelidae. — Nautilus, 7 : 30.

PILSBRY , H.A. & OLSSON , A.A., 1944 : A Venezuelan Species of *Fossula*. — Nautilus, 57 : 89.

PARODIZ , J.J. & BONETTO , A.A., 1963 : Taxonomy and zoogeographic relationships of South American Naiades (Pelecypoda : Unionacea and Mutelacea). — Malacologia, 1 (2) : 179—213.

SIMPSON , C.T., 1900 : Synopsis of the Naiades, or pearly fresh water mussels. — Proc. U.S. Nat. Mus., 22 : 51—1044.

—, 1914 : A descriptive catalogue of the Naiades or pearly fresh water mussels. — BRYANT WALKER , Detroit : I—XI, 1—1540.

STRAND , E., 1932 : Miscellanea nomenclatoria zoologica et palaeontologica, III. — Folia Zool. Hydrobiol., Riga, 4 (1) : 133—147.

Author's Address :

Dr. Argentino A. Bonetto
Instituto Nacional de Limnología
José Maciá 1933/43
SANTO TOMÉ (Pcia. Santa Fé)
REPUBLICA ARGENTINA.

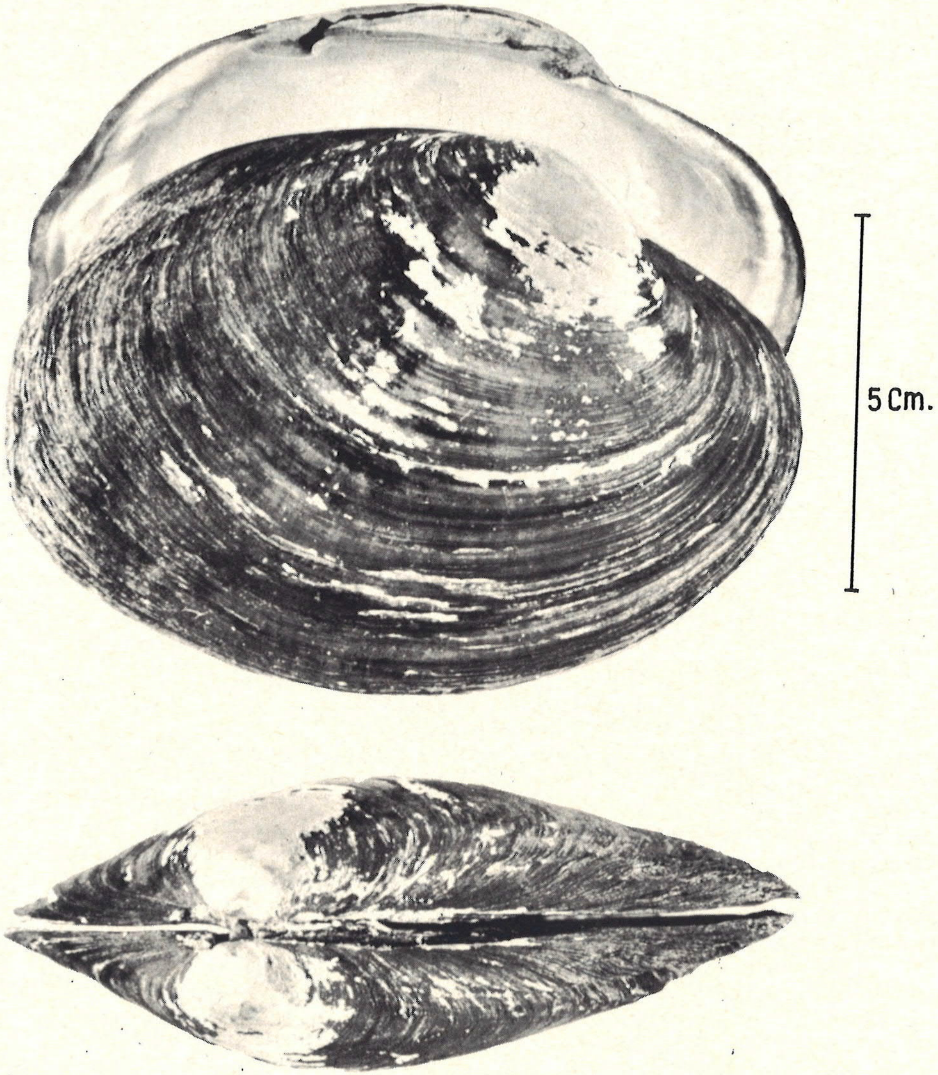


Plate I. — Holotype of *Tamsiella amazonica* n. sp.

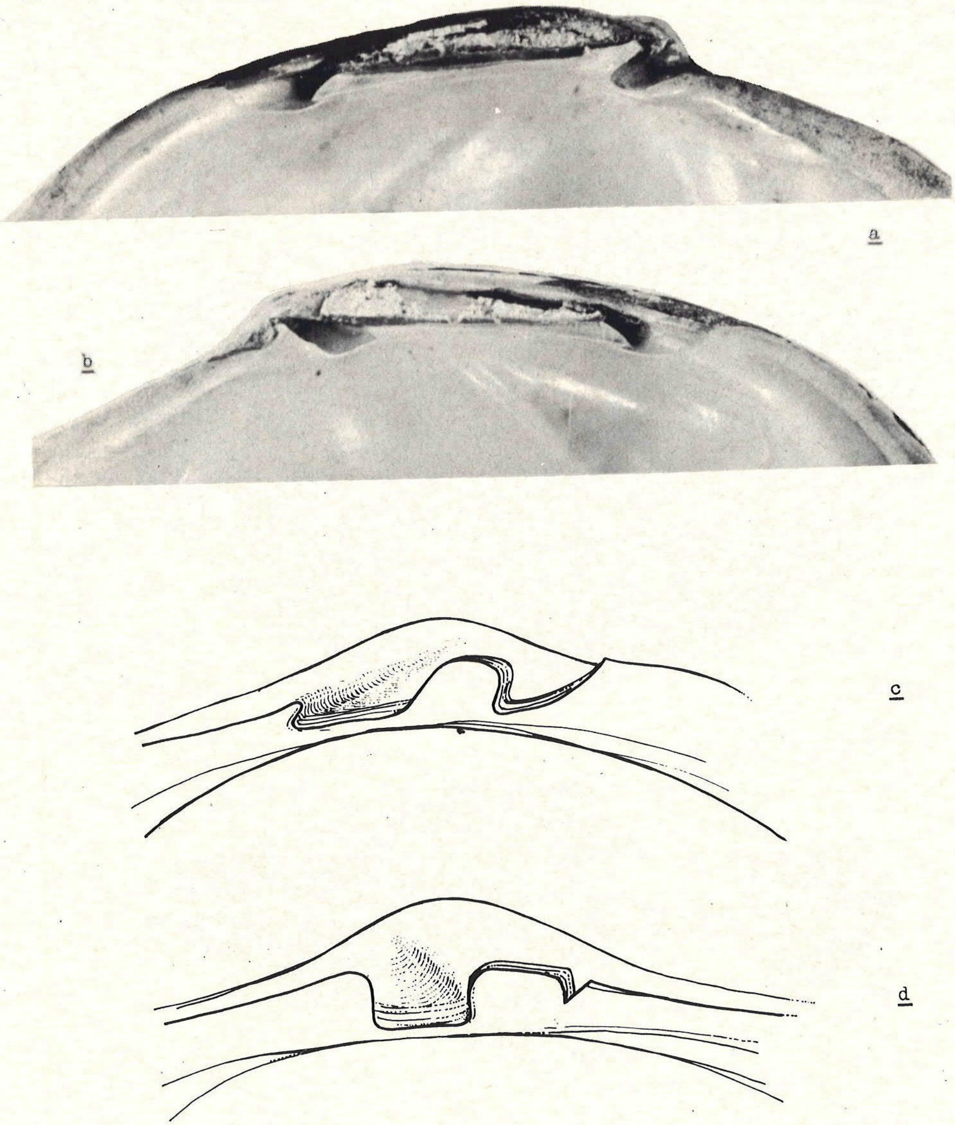


Plate II. — Details of the hinge organization of: *a* und *b*, *Tamsiella amazonica* n. sp.; *c and d*, *Fossula fossiculifera* d'Orb., Itatí, Corrientes, Argentina.